



Europäisches Patentamt  
European Patent Office  
Office européen des brevets

⑪ Publication number:

PIAS 2  
0 198 554  
A2

⑫

## EUROPEAN PATENT APPLICATION

⑬ Application number: 86200619.4

⑮ Int. Cl.: D 06 F 37/26, D 06 F 37/00

⑭ Date of filing: 14.04.86

⑯ Priority: 17.04.85 IT 2153185 U

⑰ Applicant: N.V. Philips' Gloeilampenfabrieken,  
Groenewoudseweg 1, NL-5621 BA Eindhoven (NL)

⑲ Date of publication of application: 22.10.86  
Bulletin 86/43

⑳ Inventor: Rabuffetti, Sergio, c/o INT. OCTROOIBUREAU  
B.V. Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL)  
Inventor: Maretti, Silvano, c/o INT. OCTROOIBUREAU  
B.V. Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL)

㉑ Designated Contracting States: DE FR GB SE

㉒ Representative: Gorter, Willem Karel et al.,  
INTERNATIONAAL OCTROOIBUREAU B.V. Prof.  
Holstlaan 6, NL-5656 AA Eindhoven (NL)

㉓ Tub with a tubular hub made rigid therewith by through formations of engineering polymer, for laundry washing machines with a drum of horizontal axis.

㉔ «Tub with a tubular hub made rigid therewith by through formations of engineering polymer, for laundry washing machines with a drum of horizontal axis».

Laundry washing machine with a drum having a horizontal axis, comprising a polymer tub with a tubular hub made rigid with the tub with the aid of perforations filled with polymer.

EP 0 198 554 A2

- 1 -

TUB WITH A TUBULAR HUB MADE RIGID THEREWITH BY THROUGH FORMATIONS  
OF ENGINEERING POLYMER, FOR LAUNDRY WASHING MACHINES WITH A DRUM  
OF HORIZONTAL AXIS

This utility model relates to a tub for a laundry washing machine with a drum of horizontal axis, the tub being entirely or partly of engineering polymer (filled or non-filled) and provided with a hub in which the drum shaft is rotatably supported.

Generally, in laundry washing machines provided with a drum of horizontal axis, the rotational movement of the drum, which holds the laundry and is disposed in the tub which is designed to contain the wash liquid but does not participate in the drum rotation, is effected by providing in the rear part of the tub a hub which is generally welded to it and is machined to form seats for bearings supporting a shaft which at one end is connected to the drum and at the other, external to the tub, is connected to an electric motor by way of a pulley and a transmission belt.

The hub can be of steel when the tub is of enamelled sheet steel or stainless steel.

In a recent technique, the tub is entirely or partly constructed of a filled or non-filled engineering polymer. In this technique, the hub is of die-cast aluminium which is machined at its ends to form the seats and abutments for the bearings which support the drum shaft. This hub is inserted into a mould in which it is covered by the engineering polymer which, in the same mould, forms either the rear wall of the tub or the entire tub.

However, this recent technique has some negative aspects such as the

high cost of the die-cast hub and its machining, difficulties in binding the engineering polymer to the die-cast aluminium hub, and the possibility of undesirable relative movements between the hub and tub if ribs are not provided.

The main object of the present invention is to provide a tub entirely or partly of engineering polymer (filled or non-filled) which allows a more economical construction and in which the hub is reliably and securely bonded to the engineering polymer so as to exclude any relative movement.

This and further objects which will be more apparent from the detailed description given hereinafter are attained according to the invention by a tub entirely or partly of engineering polymer, characterised essentially in that its hub comprises a tubular member peripherally containing through holes occupied by the engineering polymer which, on the inside of the tubular member, forms abutments for the rolling bearings inserted into said member.

The invention will be more apparent from the detailed description given hereinafter by way of example with reference to the accompanying drawing, in which:

Figure 1 is a partial longitudinal section through a tub according to the invention;

Figure 2 is a section on the line II-II of Figure 1; and

Figure 3 is a half section through a modified embodiment taken on the same line.

In the figures, the reference numeral 1 indicates a laundry washing machine tub in which there is disposed a conventional laundry drum, not shown, connected to the end of a shaft, also not shown, which is

supported in bearings 2, 3 mounted in a hub 4. The hub is provided in the rear wall 5 of the tub. Either the entire tub or only the rear wall 5 is of thermoplastic engineering polymer, which can be filled for example with glass fibre, or unfilled.

The hub 4 comprises a metal tubular member 6 provided with a series of radial through holes 7 preferably distributed equidistantly along the perimeter of said tubular member 6.

The tubular member is covered externally by a sleeve 9 of the same engineering polymer which forms the rear wall 5. The through holes 7 are occupied by the engineering polymer, which also extends on to the inner side of the tubular member 6 to form a ring 8 adhering to said inner side.

The ends 8a, 8b of the inner ring constitute a correct abutment for the bearings 2, 3 without the need for any machining subsequent to the injection moulding of the rear wall 5 or tub 1.

Torsional coupling to the tub 1 or rear wall 5 is ensured by the engineering polymer which extends into the holes 7.

Instead of the ring 8 of the embodiment of Figures 1 and 2, circular sectors 8c can be used (see Figure 3) disposed symmetrically about the axes of the holes 7 of the member 6. This embodiment results in a saving of engineering polymer.

The metal member 6 can be formed from an extruded aluminium tube by cutting it to the required length and providing it with the holes 7 (for example four in number). The member in question is inserted into a suitable mould associated with an injection machine for the engineering polymer. The engineering polymer injected into the mould forms the rear wall 5 or the entire tub 1, and also the sleeve

0198554

9, and occupies the holes 7 to form either the ring 8 or the circular sectors 8c comprising the abutment surfaces 8a, 8b.

PATENT CLAIMS

1. A laundry washing machine tub with a drum of horizontal axis, said tub being entirely or partly of engineering polymer (filled or non-filled) and provided with a hub in which the drum shaft is supported, characterised in that the hub comprises a metal tubular member (6) peripherally containing through holes (7) occupied by the engineering polymer which, on the inside of the metal tubular member (6), forms abutments (8a, 8b) for rolling bearings (2, 3) inserted into said tubular member.
2. A tub as claimed in claim 1, characterised in that the abutments (8a, 8b) constitute the end faces of a ring (8) or of sectors (8c) of engineering polymer on the inside of the tubular member (6).
3. A tub as claimed in claim 1, characterised in that the outside of the metal tubular member (6) is at least partly covered by engineering polymer (at 9).

0198554

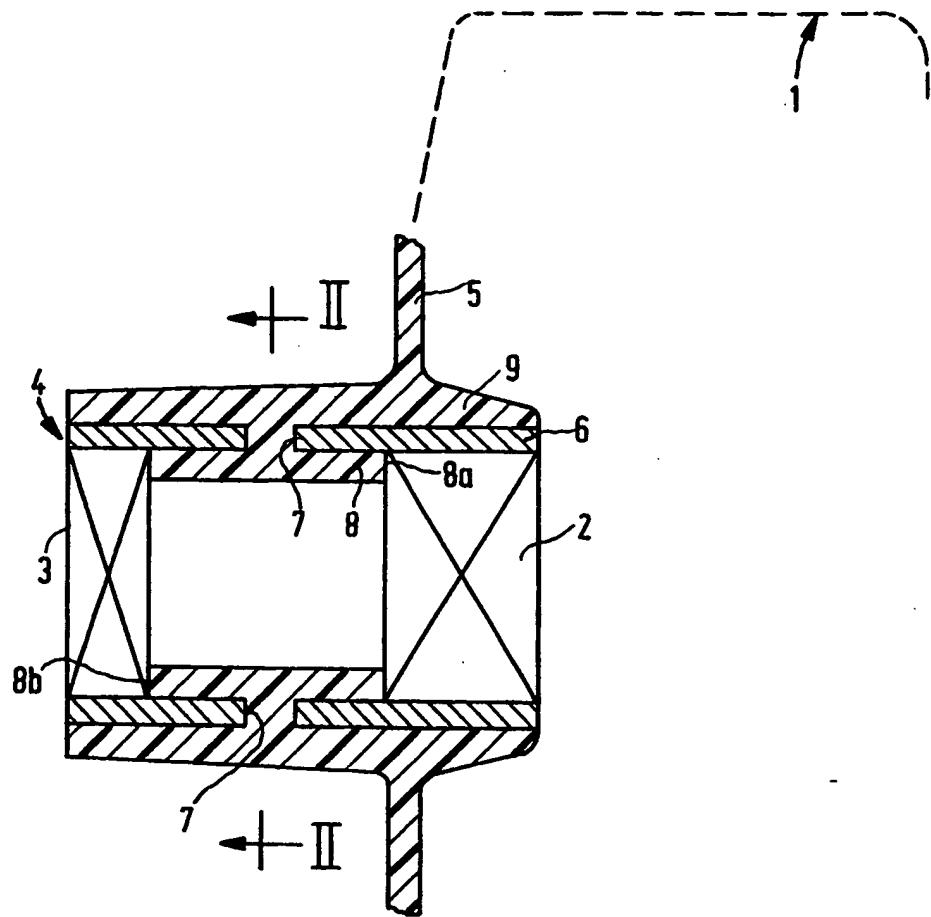


FIG. 1

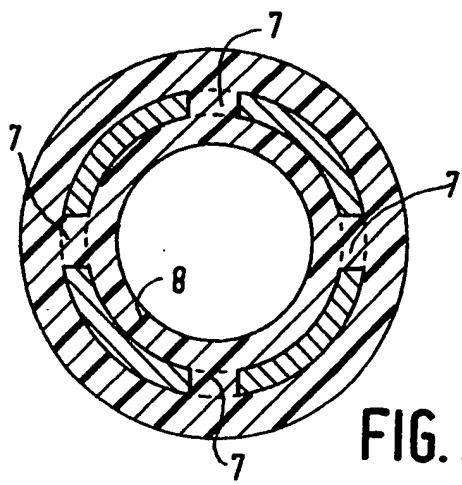


FIG. 2

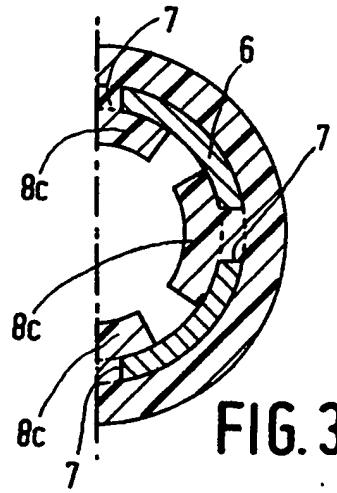


FIG. 3

PHI 85-006